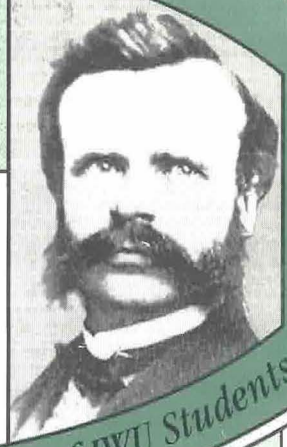
Apr 12th, 7:30 AM - 8:00 AM

Complete 2008 Program

THE NINETEENTH ANNUAL

Illinois Wesleyan University John Wesley Powell STUDENT RESEARCH CONFERENCE

2008



To Recognize the Research Projects & Creative Endeavors of IWU Students

The conference is named for explorer and geologist John Wesley Powell, a one-armed Civil War veteran and a founder of the National Geographic Society who joined Illinois Wesleyan University's faculty in 1865. He was the first U.S. professor to use field work to teach science. In 1867 Powell took Illinois Wesleyan students to Colorado's mountains, the first expedition of its kind in the history of American higher education. Later, Powell was the first director of the Smithsonian Insitution's Bureau of Ethnology.

CENTER FOR NATURAL SCIENCES

SATURDAY

APRIL 12, 2008

http://www2.iwu.edu/jwprc/

Nineteenth Annual

John Wesley Powell • IWU

Student Research Conference

Science Commons

Center for Natural Sciences

Saturday, April 12, 2008

8:30 a.m. – 6:00 p.m.

Official Program

ACKNOWLEDGEMENTS

The John Wesley Powell Research Conference Committee would like to acknowledge the contributions of several individuals.

This conference could not have been a success without the contributions of Pat Neustel, Associate Provost's Office, in organizing many aspects of the conference and assembling and printing the program booklet.

The invaluable assistance provided by Mike Welsh and his staff at Sodexho Campus Services in setting up breakfast, luncheon and other refreshments is gratefully acknowledged.

The assistance provided by Patrick McLane of Information Technology in setting up computer equipment in all rooms is greatly appreciated.

John Wesley Powell Research Conference Committee:

- Dan Terkla (English)
- Mike Seeborg (Economics)
- Stephen Hoffmann (Chemistry & Environmental Studies)
- Leah Nillas (Educational Studies)

SCHEDULE OF EVENTS

Saturday, April 12, 2008

8:	Continental Breakfast and Poster Setup	Science Commons
9:	Poster Session A	Science Commons
10:	Oral Presentations – *Session One* Sessions 1 through 5	CNS
11:	Oral Presentations – *Session Two* Sessions 6 through 10	CNS
12:	Luncheon	Main Lounge
1:	Keynote Address: Elena Glasberg	Anderson Auditorium (C101)
2:	Poster Session B	Science Commons
4:	Senior Art Show and Critique	Merwin and Wakeley Galleries
5:	Performances of Music Student Compositions	Presser Hall (308)

KEYNOTE SPEAKER

"WHO GOES THERE?: SCIENCE AND BELONGING IN CONTEMPORARY ANTARCTICA"

Dr. Elena Glasberg
Princeton University

1:15 p.m. Anderson Auditorium (C101)

This year's keynote speaker is Dr. Elena Glasberg from Princeton University. In this International Polar Year, we are particularly fortunate to have Dr. Glasberg visit, since she was awarded an Antarctic Artists and Writers Program Grant by the National Science Foundation. An interdisciplinary humanist, Elena Glasberg works in the fields of American Studies, Gender and Sexuality Studies, and her creative writing courses at Princeton focus on the Antarctic. Dr. Glasberg has been, among other things, Director of the Program in the Study of Sexuality and of the New Beginnings Faculty Research Program at Duke University; a Research Affiliate at Gateway Antarctica, University of Canterbury, New Zealand; and a Faculty Affiliate at New York University's Center for the History of the Production of Knowledge. She has published widely and is currently working on a book for the University of New England Press. *Another New World: Antarctica as Place and Symbol in the United States* investigates the ways U.S. subjects since 1820 have projected onto Antarctica fantasies and beliefs about land, knowledge, and power that cannot be brought under national control. By placing discourse about Antarctica before, beside, and after that of the U.S., *Another New World* reconsiders American empire via its relations to a fantastic Antarctic that, through the accident of geophysical reality, seemed always—and still—to await explorers and colonizers.

STUDENT PARTICIPANTS

Oral and Poster Presentations

Babawande Afolabi	P1
Steven G. Aron	O4.3
Stephanie Bannos	P2
Susan Blunck	P3
Alex Boecher	P4
Jason Bothwell	P5
Craig Brauer	P6
Quentin Brummet	O7.2
Lauren A. Carlson	P7
James Carolan	P5
Gabriel Chez	P8
Mira Coleman	P9
Lane Coonrod	O1.1
Sara Costello	P10
Dominick DeBartolo	O5.1
Michael P. DeVore	P11
Vanessa Dremonas	P12
Stephen Eyler	P13
Jennifer Faust	P14
Michael X. Feeney	O6.3
Allison Fisher	P15
Kunaey Garg	O2.2
Alex Gikas	O1.3
Claire Goble	O8.1
Anthony Gunnell	P16
Alex Hahn	P17
Rachel Halfpap	P18
Janell Harro	P19
Allison Hebron	P20
Valerie Higgins	O4.2
Kathleen Hoff	O8.2
Matthew Huddle	P21
Kristiyana Kaneva	P22
Matt Katch	O4.1
Sarah King	P23
Jim Kjelland	O1.2
Kristen Kopf	P24
Ellen Kozak	P25
Scott Krabbe	P26
Craig Landers	P27
Long N. Le	P11
Courtney Lee	P28
Kevin M. Lewis	O6.1
Marti Lyons	P29
Sudil Mahendra	P30
Christopher J. Marks	P31
Evan Mason	P32
Chris Miedema	P32
Ian Mobley	P33
Jennifer Morozink	P34
Elizabeth Mraz	P35
Melissa Myers	P36
Mary Olson	O5.2
Margaret E. Olson	P37
William Palmisano	O3.2
Stephanie Panozzo	O7.1
Ryan Peterson	P38
Teodora D. Petrova	O6.2
Julie Pflaumer	O5.3
Nathan Pratt	P39
Bryan Rea	P41
Marylee Richardson	P40
Jamie Rogers	P42
Jennifer Schnupp	P43
Lukasz J. Sewera	P31
Matthew T. Sheehan	P44
Alissa Sherman	P46
Matthew Spafford	P45
Rhiannon Steffen	P25
Steven Sturlis	P10
Scott N. Swisher, IV	O2.1
MorganTarbutton	P25

continued.....

STUDENT PARTICIPANTS

Oral and Poster Presentations

Elizabeth Taylor	O7.3
Andrew Tharp	P47
Nick Timme	O10.2
Thomas Traynor	O10.1, P48
Sarah Tribble	P49
Eric Van Hise	O2.3
Bridget Wall	O3.1, P50
Molly Walter	P51
Charlie Welke	O9.1
Jeff Wessel	P25
Jessie Yesensky	P20
Kristin Zavislak	O9.2
Krystyna Zwolinski	P52

BA/BFA SENIOR CRITIQUE HONORS
SCHOOL OF ART

Saturday, April 12, 2008, 4:00 p.m., Merwin and Wakeley Galleries

Student Presenters:

Bryan Byers

Anne Kopf

Lauren Killewald

Maria Gonzalez

Christopher Killham

Joey Knox

Refreshments will be served

MUSIC COMPOSITION STUDENT PRESENTATIONS

Saturday, April 12
5:15 p.m.
School of Music 308

Acoustic Exploration for Prepared Piano (2007) — Jesse Schaar '11

Jesse Schaar, piano

Arabesque for Violin and Piano (2007) — Christopher Zajac '08

Christopher Zajac, violin
Shabazz Ranney, piano

Journey (2007) — Amber Johnson '09

Alyssa Underwood, flute
Nicole Eddington, oboe
Melinda Mallory, English horn
Jennifer Hjelmberg, violin
Molly Price, viola
Margaret Kocher, violoncello

Music Presentation

ACOUSTIC EXPLORATION FOR PREPARED PIANO

Jesse Schaar and David Vayo*
School of Music, Illinois Wesleyan University

In this composition, I exploit various acoustic phenomena such as lowering frequency by adding mass to a resonating object, sounding harmonics by dampening a string at its node, and comparing the difference in frequency produced from the harmonic series of a string to the same pitch on the equal temperament of the piano keyboard. While this piece serves as a demonstration of these phenomena, it also uses them within a larger musical context to combine science and art.

Music Presentation

ARABESQUE FOR VIOLIN AND PIANO

Christopher Zajac and David Vayo*
School of Music, Illinois Wesleyan University

This work, influenced by composers such as Debussy and Ravel, represents a landmark in my own compositional career. It wholly represents both a style and personality, emphasized in melody, which I feel was never expanded to its full potential.

Music Presentation

JOURNEY

Amber M. Johnson and David Vayo*
School of Music , Illinois Wesleyan University

I was inspired to write this piece simply by my own life here at Wesleyan. It has been a long journey for me from First Year to junior year and I have grown very much as a student and musician. Journey is all about this growth. Originally, this piece started as just a simple melody and accompaniment for small women's chorus but as you can see, it has transformed into its own being. While writing, I eventually found that the music was becoming more lyrical as if written for string instruments rather than voices. Once I switched the instrumentation to strings, I knew exactly what I wanted for this piece.

The beginning of Journey is calm and flowing as the instruments move together. The first phrase repeats twice, reaffirming the peaceful harmonies at the beginning. The action begins to build until it rushes to the "main chorus" of the piece. At this point, the journey has begun and is in full swing. As the piece progresses, the harmonies and counterpoint become more complicated and intricate. The music builds to a climax and then ends, whispering of more journeys to come. That, for me, is the essence of my composition. Starting at one point and ending at another, not knowing where you will end up but just following the road on your own journey.

ORAL PRESENTATIONS - SESSION 1
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E103)
MODERATOR: Anna Konradi

1.1	Lane Coonrad Economics
1.2	Jim Kjelland Economics
1.3	Alex Gikas Economics

ORAL PRESENTATIONS - SESSION 2
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E104)
MODERATOR: Pat Topf

2.1	Scott Swisher Economics
2.2	Kunaey Garg Economics
2.3	Eric Van Hise Economics

ORAL PRESENTATIONS - SESSION 3
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E102)
MODERATOR: Sarah Rueth

3.1	Bridget Wall Biology
3.2	William Palmisano Environmental Studies

ORAL PRESENTATIONS - SESSION 4
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E101)
MODERATOR: Emily Franzen

4.1	Matt Katch English
4.2	Valerie Higgins English
4.3	Steven Aron Theatre

ORAL PRESENTATIONS - SESSION 5
10:00 – 11:00
CENTER FOR NATURAL SCIENCES (E105)
MODERATOR: Lesley Hunter

5.1	Dominick DeBartolo History
5.2	Mary Olson History/Greek & Roman Studies
5.3	Julie Pflaumer Greek & Roman Studies

ORAL PRESENTATIONS - SESSION 6
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E103)
MODERATOR: Tian Mao

6.1	Kevin Lewis Business Administration
6.2	Teodora Petrova Business Administration
6.3	Michael Feeney Economics/International Studies

ORAL PRESENTATIONS - SESSION 7
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E104)
MODERATOR: Jessica Kong

7.1	Stephanie Panozzo Economics
7.2	Quentin Brummet Economics
7.3	Elizabeth Taylor Economics

ORAL PRESENTATIONS - SESSION 8
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E102)
MODERATOR: Florence Soyinka

8.1	Claire Goble Psychology
8.2	Kathleen Hoff Nursing/Psychology

ORAL PRESENTATIONS - SESSION 9
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E101)
MODERATOR: Linda Martin

9.1	Charlie Welke Religion
9.2	Kristin Zavislak Greek & Roman Studies

ORAL PRESENTATIONS - SESSION 10
11:00 – 12:00 noon
CENTER FOR NATURAL SCIENCES (E105)
MODERATOR: Alex Boecher

10.1	Thomas Traynor Physics
10.2	Nick Timme Physics

Note: Student's name is underlined, faculty advisor designated with *

Presentations are 10-15 minutes in length. If time permits, there will be a question-and-answer period for all presenters following the final presentation.

Oral Presentation O1.1

EFFECTS OF AFFIRMATIVE ACTION AT IWU

Lane Coonrod and Michael Seeborg*
Economics Department, Illinois Wesleyan University

For over forty years affirmative action policies have had a place within several sectors of American society. With respect to education, many colleges and universities, including Illinois Wesleyan University, have adopted financial aid policies meant to increase diversity. This project identifies the impacts of Illinois Wesleyan's diversity adjustment policies on two levels: the impact on matriculation rates and the eventual impact on academic achievement. The study investigates whether or not minority students are victims of mismatch consequences by being admitted to a selective institution, and OLS regression analysis evaluates the effectiveness of affirmative action policies on prospective students' decision to come to IWU.

Oral Presentation O1.2

ECONOMIC RETURNS TO HIGHER EDUCATION: SIGNALING V. HUMAN CAPITAL THEORY

Jim Kjelland and Michael Seeborg*
Economics Department, Illinois Wesleyan University

It is general knowledge that individuals with higher levels of education will, on average, earn higher wages in the labor market. And while this correlation has be established, the causal relationship behind those returns to education is less clear. Past research has been done in an attempt to determine the mechanism by which education increases earnings. Human Capital Theory argues intuitively that education endows an individual with productivity-enhancing human capital, which translates into higher wages in the labor market. Signaling Theory argues instead that education acts merely as a signal of inherent human capital, and that it is the inherent human capital, not acquired human capital, that determines a worker's wage. This study employs OLS regression and is an extension of a previous study carried out by Chevalier et al (2004). Using controls for inherent ability and motivation, it explores the effects of inherent human capital on productivity and wages, and applies that understanding to an assessment of the respective merits of both Signaling and Human Capital Theory.

Oral Presentation O1.3

THE EFFECTS OF TIME USE ON ACADEMIC PROGRESS

Alex Gikas and Michael Seeborg*
Economics Department, Illinois Wesleyan University

The cost of college tuition is ever increasing. Students of Illinois Wesleyan University pay over $40,000 per year to attend the fine institution. With such a high price tag, it is expected that students have a most enjoyable college experience. However, students will not be studying or doing school work during their entire college careers. Social behavior is necessary to revitalize students' minds and bodies. Yet engaging in too much of these social behaviors will result in poor academic performance. The purpose of this study is to determine by how much certain social behaviors affect GPA. The data-set is specific to Illinois Wesleyan University students. The theories are tested using the method of Ordinary Least Squares (OLS). The regression results are quite fascinating, with some unexpected outcomes.

Oral Presentation O2.1

STOCK INDEX PRICING WITH RANDOM WALK AND AGENT-BASED MODELS

Scott N. Swisher IV and Michael Seeborg*
Economics Department, Illinois Wesleyan University

The objective of this work is to empirically test the EMH (efficient market hypothesis) and compare its results to those of a viable agent-based competitor using computational simulation. Random walk and agent-based models for the determination of stock market prices are statistically compared using the criteria of stationarity, randomness, and autoregressive behavior. The agent-based approach used, styled the "ant trader" model, is based on the ant model established by Kirman in his 1993 work "Ants, Rationality, and Recruitment". Daily returns of the Hang Seng and Nikkei 225 indices are used over the periods 1987-2007 and1984-2007, respectively. Preliminary simulations run with the agent-based model indicate high sensitivity to parameter changes; parameter imbalances lead to unrealistic growth in returns. Batch stationarity tests using ADF (Augmented Dickey-Fuller)and PP (Phillips-Perron)tests suggest that the two models behave similarly under the chosen parameter conditions. However, the random-walk model is found to be more consistent with the available data when using the Wald-Wolfowitz runs test and the Lo-MacKinlay variance ratio test. We conclude that the EMH can be theoretically challenged by the ant trader model, but not empirically. The agent-based model has more realistic assumptions and is more flexible; however, the random walk model agrees with the properties of real-world stock index return in this case, specifically stationarity and randomness.

Oral Presentation O2.2

THE EFFECT OF FEDERAL FUNDS RATE CHANGES ON STOCK PRICES: A SECTOR-WISE ANALYSIS

Kunaey Garg and Margaret Chapman*
Economics Department, Illinois Wesleyan University

The federal funds rate is an indicator of monetary policy that investors in the stock market scrutinize very closely. This paper determines the relationship between changes in the federal funds rate and sector wise stock indexes. Weekly returns of the Dow Jones ICB classified financial, energy, utilities, materials, industrials, consumer goods, consumer services, information technology, healthcare and telecommunications sectors are analyzed using separate OLS regression models for each sector. Since the financial sector's earnings are most directly affected by changes in the interest rate, I hypothesize that this sector will be the most responsive. The results show that the utilities, financials, telecom and materials sectors are the most interest rate sensitive in that order and that the relationship exhibited between the stock price and the federal funds rate is positive. I conclude by attributing the positive relationship to sector specific demand and supply effects related to the federal funds market.

Oral Presentation O2.3

THE DIFFERENCE IN OPPORTUNITY COST FOR EX-CONS IN BLUE-COLLAR AND WHITE-COLLAR WORKPLACES

Eric Van Hise and Michael Seeborg*
Economics Department, Illinois Wesleyan University

The ability to reenter the workforce after a conviction is an important factor in how an individual responds to contact with the criminal justice system. This study seeks to determine whether blue or white collar workers suffer most in terms of reduced wages and income after a conviction by using the National Longitudinal Survey of Youth. This data follows a large cohort of young people from 1997 through 2004. In the end the results from OLS regression analysis support the social underclass theory that says offenders who are blue-collar workers have a higher opportunity costs than offenders who are white-collar workers in terms of lost wages.

Oral Presentation O3.1

ORGANOCHLORINE PESTICIDE CONTAMINATION AND ITS POTENTIAL EFFECTS ON EGGSHELL CHARACTERISTICS OF DICKCISSELS (*SPIZA AMERICANA*)

Bridget Wall, Jason Koval, Stephanie Ross and
Given Harper*, Jeffrey Frick* and Stephen Hoffmann*
Biology, Chemistry and Environmental Studies Departments, Illinois Wesleyan University

Dickcissels (*Spiza americana*) are small, sparrow-like songbirds that nest in grasslands in the U.S. and winter in Venezuela. Farmers in Venezuela intentionally spray dickcissel flocks with organochlorine (OC) and other pesticides in an attempt to kill them when they feed in rice fields. Previous studies have shown that organochlorine (OC) pesticide contaminants (e.g., DDT) have significantly reduced eggshell thickness in eagles and falcons. Although DDT was banned more than twenty years ago, OC compounds and their metabolites still persist in wildlife, possibly resulting in reduced reproductive success and in disrupted endocrine systems (Harper et al. 1996). Recent studies (e.g., Harper et al. 1996, Klemens et al. 2000, Bartuszegvige et al. 2002) have shown OC contamination in Neotropical migratory passerines (i.e., songbirds that breed in Canada and the United States and winter in Mexico and Central and South America.), including dickcissels. The purpose of this study is to determine the effects of OC contamination on thickness and color (hue, saturation and brightness) of dickcissel eggshells. The ecological implications of contamination may include the effect of eggshell coloration on the amount of male parental investment, reduced hatching success of dickcissel eggs, as well as the success of dickcissels in rejecting brown-headed cowbird (*Molothrus ater*) eggs.

Oral Presentation O3.2

ESTRADIOL AND ETHYNYLESTRADIOL FROM WASTEWATER TREATMENT IN LOCAL RIVER SYSTEMS

William Palmisano and Stephen Hoffmann*
Environmental Studies Department, Illinois Wesleyan University

Estrogenic compounds, such as estradiol and ethynylestradiol, can exhibit ecotoxic effects in aquatic species, including feminization of males and sterilization of females. This project was conducted with the intent of quantitatively measuring the concentration of estradiol and ethynylestradiol, hormones found in oral contraceptives and other medication, upstream and downstream of local wastewater treatment facilities. The long-term goals of this research include determination of transport, concentration, partitioning, and bioaccumulation of these hormones in the aquatic environment. Analysis included solid-phase extraction, derivitization with MSTFA, and analysis with gas chromatography-mass spectrometry. Quantification was performed through addition of an internal standard containing ^{13}C enriched estradiol and ethynylestradiol.

Oral Presentation O4.1

CHAUCER'S *CANTERBURY TALES*: A FRAGMENTARY PILGRIMAGE

Matt Katch and Dan Terkla*
Religion Department, Illinois Wesleyan University

The ordering of *The Canterbury Tales* has been contested since the work was first put into publication after Chaucer's death. Looking at the discrepancies between the eighty-three surviving manuscripts and the six incunabulae exposes the many ways in which the working canon for the *Tales* is simply a mess, and it will never be known for certain what Chaucer intended. However, this paper analyzes existing arguments while also proposing new ideas about the ordering of the ten tale fragments, which compose *The Canterbury Tales*, in an attempt to come closer to an accurate structure. Through consideration of various criteria, the Ellesmere manuscript order is shown as the most likely tale order. Alternative popular structures are also examined, including the Chaucer Society order, as set forth by Henry Bradshaw and Frederick J. Furnivall. This issue continues to come up in modern debate, such as with Norman Blake who is working on a new edition of the Tales, and this paper seeks to demystify many of the aspects surrounding this complex phenomena.

Oral Presentation O4.2

"RILLS: A MAP OF A MISREADING"

Valerie Higgins and Michael Theune*
English Department, Illinois Wesleyan University

"Rills: A Map of a Misreading" is the first in a collection of essays that explore multiple ways of reading and responding to the works of the British Romantics. This essay merges a personal and critical approach to Samuel Taylor Coleridge's "Kubla Khan" and shows my resulting realization of the rewards such a reading can offer. I use a personal reaction to a small detail in order to arrive at a fuller understanding of the poem. When my misreading is corrected and the image that had been the basis of my love of the poem changed, I am able, with the aid of the theories of Coleridge, Shelley, and Wordsworth regarding the imagination, to perceive the full extent of my imagination's workings and come to appreciate them more fully, as these and other Romantic writers did. This experience mirrors the very act of imaginative creation that the poem portrays, and it allows me to engage with the poem on a new level.

Oral Presentation O4.3

EXPLOITATION AND OBJECTIFICATION IN DOCUMENTARY THEATRE

Steven G. Aron and Sandra Lindberg*
Economics Department, Illinois Wesleyan University

Traditionally, works of theatre have been fictional in content and character. However, in the 20th century, a trend started that reflects a more journalistic, documentary movement in theatre. Playwrights and devising companies began crafting plays out of stories shared by real people, even going so far as to incorporate non-actors to share their lives with the audience. Though this created a greater verisimilitude, it also posed a new risk to legitimate works: that of exploiting or misrepresenting the people's stories presented in the production. Just as in documentaries on the screen, those in charge of crafting the production, whether it be a writer or a troupe devising the performance collaboratively, can sometimes exploit the subject matter and end up objectifying those they are trying to help. Misrepresentation of source material can be accidental, and it can be deliberate, but in either case, exploitation needs to be avoided in order to pay the subject(s) proper respect and to ensure a successful production. This paper looks at plays that have these realistic attributes and examines how they kept their testimonials in context and honorable to their donors.

Oral Presentation O5.1

REFUGEES FROM THE 1ST THROUGH 4TH CENTURIES: RACIAL, ECONOMIC, CULTURAL, AND PRACTICAL ISSUES ALONG THE BORDERS

Dominick DeBartolo and Jason Moralee*
History Department, Illinois Wesleyan University

Much like our modern world, ancient refugees sought out Rome as a land of wealth and security. The classical literary sources (e.g. Tacitus, Cassius Dio, Ammianus Marcellinus, etc.) have provided posterity with a wealth of descriptions of refugee incidents. Through these accounts of refugees to and from Rome, we can piece together an understanding of Rome's level of control over her borders, and more generally, over large population movements. This process will also shed light on other issues such as motives, biases, and economic factors amongst others. Based upon the incidents described by the classical historians throughout the 1st through 5th centuries, we see what appears to be an evident fluctuation in the level control exercised by the Romans. Furthermore, the contemporary awareness of the benefits and disadvantages of allowing refugees to in Rome will also be highlighted in this process. Most importantly among all of these issues, simple economic gains and losses tended to be the most significant motive behind the actions of both the refugees and the Romans.

Oral Presentation O5.2

"PRISON AS A HOME": CHRISTIAN PERCEPTION OF IMPRISONMENT IN THE AGE OF MARTYRS

Mary Olson and Jason Moralee*
History and Greek and Roman Studies Departments, Illinois Wesleyan University

Prisons in the Late Antique world were intended, by those in power, to function as a sort of half-way house for the accused awaiting trial or the condemned, awaiting death. Legal understanding of prison was not, however, what resulted for all classes and social groups. Though it was unintentional, prisons became yet another form of punishment to the masses. The *Digests* of Justinian outlined what prisons were intended to be and how they should be used. Treatment of detainees, however, differed due to class. The fourth-century author Libanius rallied against prisons, deplorable conditions, and the suffering therein. Though the pagan author Libanius was reform-minded, it is with the Christians that prison shifts from a place of suffering to a locale for salvation. Spiritual revelation became the main purpose of prisons; prisons were thereby transmuted into theoretical havens that assisted the transition into the next world. By reading matyrologies and saints, lives in comparison with Roman legislation, we will see how prisons were conceived officially by the state and its representatives as well as how Christians transmuted the punitive purpose of imprisonment into a spiritual reckoning. Although prisons changed little during Late Antiquity, the perception and the understanding of prisons varied by social groups; from the law-makers to the common man, but it was the Christians who applied a higher spiritual meaning to what was an inconvenience to some and an unintentional form of suffering to others.

Oral Presentation O5.3

AUGUSTUS AND THE EQUITES: DEVELOPING ROME'S MIDDLE CLASS

Julie Pflaumer and Jason Moralee*
Greek and Roman Studies Department, Illinois Wesleyan University

From its founding in 753 B.C.E. until the end of the republic in the late first century B.C.E., Rome was constantly changing, growing, and developing. Under the principate of Augustus, a more intricate political system arose which was better able to handle the growing administrative needs of the Roman empire. In order to fill the gaps in the empire's new political infrastructure, Augustus built up a preexisting social class into a new order that would be able to complete the new bureaucracy of the principate. This class was the *ordo equester*, which Augustus transformed into an integrated political group of the principate. This paper will determine the *equites'* role in the principate, concentrating on how the class changed as Rome transitioned from republic to principate. While scholars recognize Augustus' role in using the equites to form a solid administrative system, my paper will use two detailed case studies which demonstrate that the equites' development created a middle class in Rome, which until this time did not exist as a recognizable entity.

Oral Presentation O6.1

THE FAKE AND THE FATAL: THE CONSEQUENCES OF COUNTERFEITING

Kevin M. Lewis and David Marvin*
Business Administration Department, Illinois Wesleyan University

Counterfeiting is a problem that extends far beyond pirated CDs and replica designer handbags. In actuality, counterfeiting is an ever-increasing phenomenon that costs the U.S. hundreds of billions of dollars each year, puts jobs and consumer safety at risk, and has links to global organized crime and terrorist organizations. Any product or idea can be counterfeited, including circuit breakers, prescription drugs, and even Harry Potter books. This presentation will examine counterfeiting from an economic, legal, and social perspective, and not only describe the negative impact of counterfeiting, but also suggest measures that can be taken to mitigate or eliminate these problems.

Oral Presentation O6.2

MORE ON THE EFFECT OF HOUSING PRICES ON THE STOCK EXCHANGE INDEX IN BULGARIA

Teodora D. Petrova and Elisabeta Pana* and Robert Leekley*
Business Administration and Economics Departments, Illinois Wesleyan University

The recent credit crunch and the subsequent financial market crash in the U.S suggest that the real estate market and the stock market are related more than people might expect. The rapidly growing real estate market and the continuously expanding stock market in Bulgaria indicate some correlation. This study presents an empirical analysis that estimates the effect of changes in the real estate market on the Bulgarian stock market between 2001 and 2007 using an OLS regression. The results suggest that the change in housing prices influence changes in the stock market. However, these results are not robust enough due to the small size of the sample and the lack of consistent data available prior to 2001. Nevertheless, the results of this study appear to have important implications for further research on the effect of changes in housing prices on the Bulgarian stock exchange index.

Oral Presentation O6.3

U.S. ETHANOL: INDUSTRIAL ORGANIZATION AND INTERNATIONAL TRADE

Michael X. Feeney and William Munro*
Economics and International Studies Departments, Illinois Wesleyan University

As crude oil prices continue to rise and the earth's petroleum reserves are continually depleted, ethanol has developed to meet the international demand for alternative automotive fuel sources. This study analyzes the industrial organization of the United States, ethanol production industry as well as trends in the percentage of farmer owned production capacity. As an emerging industry there is still much to be determined about the appropriate structure of the U.S. ethanol production industry as well as the structure of the international trade policy which will helps to shape it. Through an analysis of the historical trends in percentages of farmer owned capacity with respect to overall market concentration as well as the effects of a removal of the international trade barriers to ethanol, this study looks to predict the resulting industrial organization of U.S. ethanol production and its appropriateness.

Oral Presentation O7.1

TRENDS AND INFLUENCES IN CHINA'S MANUFACTURING SECTOR

Stephanie Panozzo and Michael Seeborg*
Economics Department, Illinois Wesleyan University

The increasing globalization of the world economy has led to a large movement of manufacturing activity to China from developed countries, especially over the past decade. However, statistics show that the proportion of Chinese labor devoted to manufacturing has decreased over the same period. Using data from the China Statistical Yearbooks 1994-2006, this study explores this paradox, focusing particularly on the effect of foreign direct investment (FDI) on the number of workers in China's manufacturing sector. Contrary to popular belief, this study finds that FDI has little correlation with the amount of Chinese laborers in manufacturing and explores alternative explanations for the decrease, including technological advance and the decline of state-owned enterprises.

Oral Presentation O7.2

THE EFFECT OF GENDER INEQUALITY ON GROWTH: A CROSS-COUNTRY EMPIRICAL STUDY

Quentin Brummet and Ilaria Ossella-Durbal*
Economics Department, Illinois Wesleyan University

Recently, a large amount of economic literature has focused on the empirical determinants of economic growth, especially the impact of human capital. These studies have established that human capital is a very significant determinant of growth. However, relatively few studies have examined the effect of misallocation of human capital on the basis of gender. Furthermore, those that have studied gender inequality include different measures of inequality and use different control variables. Therefore, this study attempts to investigate what measures of gender inequality are the most significant, using Ordinary Least Squares regressions and more recent data than past studies. The results show that gender inequality in primary education has a significant negative effect on growth, indicating that governments and international organizations should concentrate on promoting primary education equality for females.

Oral Presentation O7.3

DETERMINANTS OF CRACK COCAINE TRIAL AND ADDICTION

Elizabeth Taylor and Robert Leekley*
Economics Department, Illinois Wesleyan University

This paper examines how socioeconomic factors contribute to initial use of crack cocaine and to eventual addiction. The paper focuses on two specific questions: what characteristics influence crack cocaine use initially and why do people continue to use crack cocaine? In order to answer these questions the paper utilizes basic supply and demand theory as well as general physiological theory on drug dependence. These theories, coupled with previous literature, suggest characteristics that would increase the probability of a person trying crack cocaine. However they also indicate that once a person has become addicted, these characteristics no longer matter. Ordinary Least Squares regressions as well as logistic models are utilized on crack cocaine related data from the 2006 *National Household Survey on Drug Use and Health.* In general, results are consistent with the theory. It also appears that historical associations between race and crack cocaine use seem to have changed.

Oral Presentation O8.1

MOTOR AND COGNITIVE TASKS EFFECTS ON PRE-FRONTAL THETA

Claire Goble and Joseph Williams*
Psychology Department, Illinois Wesleyan University

The effects of social rejection on pre-frontal theta were recently studied by Dr. Joseph Williams and Dr. Doran French in a chat room environment. By deceiving their participants into believing they were chatting with two students from other college campuses in Illinois, Williams and French easily socially rejected the participant using confederates and scripts. During the time of social rejection, the participants typed less and read less text on the computer screen. Although Williams and French found an increase in pre-frontal theta during this time, two possible confounds arose: less cognition and less motor from the participants. Therefore, the current study determined whether pre-frontal theta increased during motor and cognitive tasks, and if this increase is significant when compared to the increase in pre-frontal theta during social rejection. Pre-frontal theta has been measured using electroencephalograms since 1929, proving the effects of various types of activities on theta, including cognition and motor skills. Males and females from Illinois Wesleyan University general psychology classes completed sets of short and long motor and cognitive tasks. In an effort to recreate the exclusion phase of Williams and French's study, participants were asked to retype sentences echoing the amount of sentences typed during social exclusion in the previous study, which were presented in phases of fourteen lines and twenty-four lines. Participants were also asked to comprehend a chat between three students, one of which was socially excluded. The chats also echoed the amount of sentences read during the exclusion phase of the previous study, as the cognition phases were presented in fourteen and twenty-four line segments. It is predicted that the motor and cognitive activities will not produce a significant change in theta, as compared to the theta increase in reaction to social rejection. Results will be discussed during the presentation.

Oral Presentation O8.2

FAMILY EXPERIENCE WITH EATING DISORDERS SCALE: ESTABLISHING PREDICTIVE VALIDITY AND EVALUATING THE CLINICAL UTILITY OF ITS USE IN TREATMENT

Kathleen Hoff and Victoria Folse*
School of Nursing, Illinois Wesleyan University

The family plays a significant role in the development and maintenance of eating disorders, and may be equally influential in recovery. Identifying specific familial variables that place individuals at risk for developing an eating disorder may also be useful to engage the family in treatment and to enhance treatment outcomes. The Family Experience with Eating Disorders Scale (FEEDS) was developed because of the psychometric deficits in existing general family assessment instruments and because family dynamics specific to eating disorders were not captured in available measures. The 53-item FEEDS assesses family dynamics specific to eating disorders, including relational dynamics, interaction skills, and modeling of weight, shape, and eating. This presentation will examine additional psychometric testing of the FEEDS to assure its appropriateness for use in clinical practice. Emphasis will be placed on the unique challenges of conducting research in a clinical setting using an instrument previously used only for research purposes including issues with employing clinicians as data collectors. A client version of the FEEDS was developed for this study to test the degree of congruence in parent-child perception of family dynamics. Moreover, a scoring rubric was created for current clinical use based on previous normed data comparing parental responses between families whose child has either an eating disorder, a non-eating disorder psychiatric disorder, or no mental health condition. The degree of predictive validity pre and post treatment and at 4 session intervals will be examined. Additionally, data will be presented on the level of satisfaction with the use of the FEEDS in establishing and evaluating treatment goals. The outcome of this study may have clinical and research implications and may consequently guide the direction of therapy when familial factors are identified at the beginning of treatment and incorporated into the plan of care.

Oral Presentation O9.1

THE CHRIST EPIDEMIC: HOW THE GOSPEL OF JESUS SPREAD

Charlie Welke and Kevin Sullivan*
Religion Department, Illinois Wesleyan University

The gospel message of a resurrected Savior is a tough one to swallow. How is it that salvation, if there is such a thing, is to come through the raising of one man from the dead? The earliest Jewish texts seem to be absent of any resurrection theology. It is my belief that the first century Roman world was primed for belief in a resurrected Messiah. The Jewish tradition had grown to accept the afterlife, regional cultic religions had examples of resurrection theology, the Hellenizing Greek empire had changed man's way of looking at the world, and the imperial cult of the Roman Empire had unified people of all different cultures under one power. The first century was the only time in history a resurrected Savior could be accepted. Maybe this is why the apostle Paul claimed in Romans 5: 6 that "at just the right time, while we were still powerless, Christ died for us" (NIV).

Oral Presentation O9.2

ABRAHAM LINCOLN: AMERICA'S AUGUSTUS?

Kristin Zavislak and Jason Moralee*
Greek and Roman Studies Department, Illinois Wesleyan University

Recently the American media has shown a remarkable interest in Classical culture. Whether it's through Frank Miller's graphic novel *300* or HBO's *Rome* series, the stories from these great civilizations of the past are finally taking their place in the spotlight again. But this isn't the first wave of "classicism" to hit America. Following the revolutionary war, architects and sculptors began to construct many of the most public and prominent buildings and statues, especially those in commemoration of our presidents, following Greco-Roman models. Through examination of coins and portraits of Augustus that were mass-produced during the Early Roman Imperial Period and of the coins and statues of Abraham Lincoln that were created shortly after his death, I will attempt to show how similar these two leaders were. How they each managed to domesticate their images, coming out of a civil war, so that they appeared as humble saviors of their people and homelands rather than victorious conquerors. I will also show how the propaganda technique invented by Augustus of placing self-portraits and symbolic, thematic images on public pieces of art to garner political support was also used by Lincoln's successors. The result of this propaganda is the memory of the periods of Augustus and Lincoln's leadership as "Golden Ages" of peace.

Oral Presentation O10.1

INVESTIGATION OF THE EFFECT OF SHAKING THE FRONT PLATE OF A MANDOLIN

Thomas Traynor and Andrew Morrison*
Physics Department, Illinois Wesleyan University

Like any vibrating object the front and back plate of a mandolin will have mode shapes and operating deflection shapes when vibrated. The goal of this project was to test whether or not shaking the front plate, a common practice by luthiers during construction, changes the operating deflection shapes that occur during the vibration of the front plate. Some luthiers claim that shaking the front plate during construction will actually break down some of the cellular structure in the wood causing the instrument to have a better sound, like a well-played mandolin. Using speckle pattern interferometry, the front plate of a mandolin was characterized during construction before and after it had been shaken. This data will also be compared to the analysis of the front and back plate of a student mandolin.

Oral Presentation O10.2

THE MODE SHAPES AND FREQUENCIES OF CARBON FIBER PLATES

Nick Timme and Andrew Morrison*
Physics Department, Illinois Wesleyan University

In this presentation the effects of the orthogonal construction of cured carbon fiber plate on the vibrational behavior of carbon fiber plates with various shapes and boundary conditions are discussed. Specifically, the mode shapes and mode frequencies will be presented. The vibrational behavior of these objects was observed using speckle-pattern interferometry. In addition, the challenges of imaging various objects using speckle-pattern interferometry will be explained, along with several methods for overcoming these challenges.

POSTER SESSION A

9:00 - 10:00 a.m.

Odd-Numbered Posters

POSTER SESSION B

2:35 – 3:35 p.m.

Even-Numbered Posters

Note: Student's name is underlined, faculty advisor designated with *

During each poster session the author will be present to discuss her or his research with conference attendees, and answer questions.

Please remove your posters by 4:

Poster Presentation P1

BIAS PARADIGMS

Babawande Afolabi, Maria Gobbi, Nathan Wheatley, Monica Simonin, Erica Podrazik, Andrew Clott, Charlie Sell and Juan Gomez-Albarello*
Political Science Department, Illinois Wesleyan University

This paper began as an inquiry into the relative lack of source citations originating from developing nations in scholarly work. We hypothesized that there was some form of deliberate exclusion of these articles on the part of researchers in the developed world. However, when we broadened our research we realized that what we realized that this trend was actually part of a larger global dynamic of information as a commodity which is being traded between the developed and developing world. As a result of the commoditization of information, developing countries are at a decided disadvantage because they cannot afford the high price knowledge commands. The developed world has tried to assist the developing world, but this has resulted in a relationship which is neo-colonial in nature, where the developing world is essentially dependent upon the developed world. In fact, "academic colonialism" has led to the stifling of academic advancement in developing countries as developed nations. Whether on purpose or by accident, developed nations substitute their own views and perspectives through the "help" they give to the developing world. Of course, the fact that intervention by the developed world is even happening speaks volumes to the lack of educational capital within these countries. The simple fact that these countries lack resources is a strong reason for the lack of sources from developing nations, as would be the lack of educational capital.

Poster Presentation P2

THE IMPACT ON ECONOMIC ACTIVITY OF ASSET ALLOCATION AND CREDIT CONDITIONS AT SMALL BANKS

Stephanie Bannos and Elisabeta Pana*
Business Administration Department, Illinois Wesleyan University

This study is directed towards the effects of bank capital pressures, asset allocation, and other economic shocks on the performance of economic activity. I estimate the effect of these factors on employment, payrolls, and number of firms by firm size in the United States. One conclusion is that banks reduced their total supply of bank credit after loan losses reduced their capital levels. A number of former studies arrive at this conclusion, and this paper applies that hypothesis to more recent data. Another common theme in the literature is that a "credit crunch" causes particular stress on small businesses because of their heavy reliance on external financing, which is mainly provided by small local and regional banks. Small banks have historically been thought to have special ties to small businesses, and with the consolidation of the largest banks (and subsequent focus on relationships with the largest businesses) over recent years, this study reveals how the relationship between small banks and small businesses has increased. Using small, medium, and large bank data from 1997 to 2006, this study finds that real activity is affected by variations in bank credit conditions and that businesses that were more "bank dependent" responded more to conditions in the banking sector.

Poster Presentation P3

DETECTION OF HEAVY METALS IN KIDNEY TISSUE OF NORTH AMERICAN GREY WOLVES (*CANIS LUPUS*) USING INDUCTIVELY COUPLED PLASMA EMISSION SPECTROMETRY

Susan Blunck, Patty Troxell, Sarah Rueth, Alex Ozaki and
Stephen Hoffmann*, Jeffrey Frick*, and Given Harper*
Chemistry and Biology Departments, Illinois Wesleyan University

Sizeable grey wolf (*Canis lupus*) populations in North America are currently found in Alaska, Canada, Idaho, Wyoming, Montana, Michigan, Minnesota and Wisconsin. Since the grey wolf is at the top of its food chain, biomagnification may cause this species to contain high levels of some heavy metals, especially in areas where minerals have been extracted. However, no studies have documented heavy metal contamination in grey wolves throughout their North American range, which is the purpose of this collaborative study with the U.S. Fish and Wildlife Service and with state and Canadian wildlife agencies. Wolves were either found dead or were collected via lethal control methods and hunting from 2005 to 2007. The presence of heavy metals in wolf kidneys was determined via Inductively Coupled Plasma Emission Spectrometry at the University of Wisconsin-Madison; 120 kidneys were analyzed for aluminum, cadmium, copper, iron, lead and zinc. Differences in concentration levels due to sex and location will be evaluated; furthermore, a regression analysis will be used to assess possible relationships among heavy metals. The knowledge gained from this study may have implications for other top endangered predators in North America [e.g., red wolves (*Canis rufus*), Mexican grey wolves (*Canis lupus baileyi*), grizzly bears (*Ursus arctos*), and polar bears *(Ursus maritimus*)].

Poster Presentation P4

A SIMPLE SPECKLE-PATTERN INTEFEROMETER

Alex Boecher and Andrew Morrison*
Physics Department, Illinois Wesleyan University

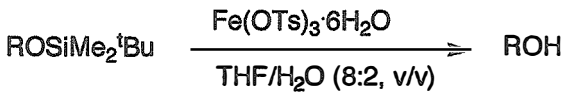
A speckle-pattern interferometer is a useful tool for characterizing the mode shapes of resonant structures. Many designs are expensive to build, requiring specialized components. Moore created a less-expensive speckle-pattern interferometer (Am.J.Phys. 72, 1380 (2004)) with common lab equipment for use in undergraduate and secondary education labs. The goal of this project was to design a simple speckle-pattern interferometer that was not only inexpensive, but would be flexible enough to be used in a wide variety of undergraduate research experiments. Many simplifications have been made to the system such as the ability to make real-time adjustments without having to restart an entire data collection run. We will present results of a variety of objects studied using the interferometer constructed here at Illinois Wesleyan University.

Poster Presentation P5

IRON (III) TOSYLATE CATALYZED DEPROTECTION OF TBDMS ETHERS

Jason M. Bothwell, James P. Carolan, and Ram S. Mohan*
Chemistry Department, Illinois Wesleyan University

tert-Butyldimethylsilyl (TBDMS) ethers are useful protecting groups for alcohols in organic synthesis. Traditional methods for deprotecting TBDMS ethers utilize fluoride containing reagents such as tetrabutylammonium fluoride (TBAF), which is highly corrosive and toxic. We have developed an iron (III) tosylate catalyzed (1.0-5.0 mol%) deprotection of TBDMS ethers in aqueous THF as well as CH_3OH as the solvent. Iron(III) tosylate is an attractive catalyst because of its low cost, low toxicity, and ease of handling. The results of this study will be presented.



Poster Presentation P6

RESOLVING TAXONOMY OF CASTRATING CRUSTACEANS

Craig Brauer and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

The Northeast Pacific bopyrid isopod crustaceans *Ione cornuta* (Bate, 1864) and *Orthione griffenis* (Markham, 2004) parasitize, castrate and sometimes control the populations of their estuarine burrowing shrimp hosts. The epicaridan, microniscan and cryptoniscan larval stages have not been described for any eastern Pacific bopyrid because the lack of morphological similarity among bopyrid larval stages and the adult stage has hindered taxonomic identification. This further limits research on the ecology, geography, and dispersal of bopyrid isopods. Unmated reproductive females of *I. cornuta* and *O. griffenis* were transplanted in their hosts, in-situ, to attract, capture, and, positively identify the cryptoniscans. The trapping method for capture of cryptoniscans to resolve taxonomy opens bopyrid larvae for study in marine and estuary ecosystems.

Poster Presentation P7

VALIDATION OF A MEASURE OF INFERENTIAL, HOLISTIC, AND AFFECTIVE INTUITION

Lauren A. Carlson and Jean Pretz*
Psychology Department, Illinois Wesleyan University

A new theory of intuition synthesizes current theoretical models to suggest the existence of three types of intuition: inferential, holistic, and affective (Pretz & Totz, 2007). However, current measures of intuition inadequately assess these three types. In response, a new intuition inventory, the Types of Intuition Scale (TIntS), was created containing subscales measuring inferential, holistic, and affective intuition. The current study established the factor structure and validity of this new measure. A factor analysis of the TIntS was completed by collecting data from 332 participants. This analysis revealed four distinct kinds of intuition. Additionally, 257 of these participants completed other measures of intuition and personality to establish validity. Correlations among the four factors of the TIntS, other measures of intuition, and personality inventories supported convergent and discriminant validity of the TIntS.

Poster Presentation P8

THE EDUCATIONAL BENEFITS OF COMICS BOOKS AND GRAPHIC NOVELS

Gabriel Chez and Ana Floriani*
Educational Studies Department, Illinois Wesleyan University

Comic books/graphic novels are read by youths in the United States. These texts, however, are not typically incorporated into the classroom because of their different format, a belief that they are not quality reading material, and violent content. My presentation will display research that shows educational benefits of comics, particularly with literacy development, English Second Language (ESL) students, language development, and cross-curricular usage. Combining illustrations and literature, these texts are a way to incorporate art into the curriculum. Professionals who use comics in their curriculum also notice higher student involvement, improved writing, and enhanced understanding of text and language. Although in some cases these texts contain racism and sexism, they can also be used in a way that makes youth aware of how certain groups are stereotyped in an unfair way. Comics are a means for students to enjoy learning and make strides academically.

Poster Presentation P9

CAUDAL FIN SKELETAL DEVELOPMENT: A COMPARISON BETWEEN *MOENKHAUSIA SANCTAEFILOMENAE* AND *DANIO RERIO*

Mira Coleman and Brian Walter*
Biology Department, Illinois Wesleyan University

Our research is focused on elucidating the developmental mechanisms that underlie morphological diversity among closely related organisms. In this study, embryological and histological techniques were used to analyze developmental variation in the caudal fin between two species of fishes, *Moenkhausia sanctaefilomenae* and *Danio rerio.* To visualize the patterning of cartilage and bone growth in the caudal fin, whole mount Alizarin red and Alcian blue staining was used to bind calcium and cartilage extracellular matrix, respectively. Thus, the dynamic processes of cartilage growth and endochondral ossification could be visualized at various larval developmental time-points. When comparing the *M. sanctaefilomenae* and *D. rerio,* time-points that are correlated with significant changes in the developing caudal fin could be established and used for frames of reference. In general, *M. sanctaefilomenae* displayed more rapid skeletal development in the caudal fin than did *D. rerio.* The next step of our research will include the analysis of genes known to be responsible for skeletal development in order to account for the differences observed between these two species.

Poster Presentation P10

THE DEVELOPMENT OF NOVEL THERAPEUTICS FOR SICKLE-CELL DISEASE

Sara Costello, Steven Sturlis and Brian Brennan*
Chemistry Department, Illinois Wesleyan University

Sickle-cell disease has been widely studied since the disorder was first described early in the 20th century. It is caused by a mutation in the gene coding for adult hemoglobin which leads to protein aggregation. The aggregated protein changes the shape of red blood cells and causes severe pain, fatigue and organ damage in afflicted individuals. Despite the fact that the molecular basis for sickle cell disease was first discovered in 1957 and its molecular mechanism has been described in detail, no effective treatment has thus been discovered.

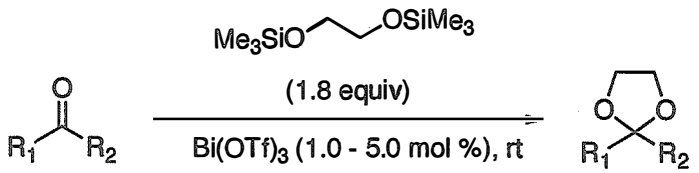
As a novel approach to treating this ailment, our research focuses on the discovery of molecules that can bind to sickle-cell hemoglobin and disrupt protein polymerization. Our initial studies have focused on peptides and peptidomimetics (oligomers which mimic peptides) due to their great diversity and ease of synthesis through solid phase techniques. In fact, others have recently shown small peptides derived from hemoglobin are capable of disrupting the interaction. Using a combination of rational design and screening approaches, we hope to discover new therapeutic agents and help treat this devastating disease.

Poster Presentation P11

BISMUTH TRIFLATE CATALYZED SYNTHESIS OF DIOXOLANES USING 1,2-BIS(TRIMETHYLSILOXY)ETHANE

Michael P. DeVore, Long N. Le, and Ram S. Mohan*
Chemistry Department, Illinois Wesleyan University

Cyclic acetals (dioxolanes) are useful protecting groups for aldehydes and ketones but common methods for their synthesis use toxic and/or corrosive catalysts. We have developed a mild and efficient bismuth triflate synthesis of dioxolanes from aldehydes and ketones using 1,2-bis(trimethylsiloxy)ethane under solvent free conditions. Bismuth compounds are attractive as catalysts because of their remarkably low toxicity and ease of handling. The results of this study will be presented.



Poster Presentation P12

THE "EVOLUTION" OF MEDIA: THE EFFECTIVENESS OF A MEDIA LITERACY CAMPAIGN

Vanessa Dremonas and Natalie Smoak*
Psychology Department, Illinois Wesleyan University

For decades, society has criticized the media for instigating many of the physical, social, and psychological maladies that affect females of all ages. However, recent advertising approaches, namely the Dove Campaign for Real Beauty, endeavor to sell products by responsibly endorsing attainable beauty ideals. The present study seeks to determine whether campaign efforts like Dove's are successful at reducing negative female body image, or whether they are instead counterproductive to their goal due to what social psychologists term "sleeper effect" processes. 102 female undergraduates were either exposed to the Dove commercial "Evolution" in its entirety, "Evolution" in part, or a control commercial. These women then reported both implicit and explicit body image-related beauty perceptions of both self and others immediately following the commercial and again one week later. Results indicated that the commercial viewed influenced several explicit body-image related attitudes. The effect of time on these perceptions will also be addressed.

Poster Presentation P13

THE EFFECT OF AN ENRICHED SOCIAL REARING ENVIRONMENT ON DOPAMINE CONTAINING NEURONS OF THE MIDBRAIN VENTRAL TEGMENTAL AREA IN RATS

Stephen Eyler and Byron Heidenreich*
Psychology Department, Illinois Wesleyan University
Illinois State University

Previous research suggests that rats reared in an enriched environment resist dopamine (DA) neuron loss associated with induced Parkinson,s disease better than rats reared in a standard environment. Because of this apparent neuroprotective effect, this study examined whether rats reared in an enriched environment would show greater numbers of DA containing cells in the midbrain ventral tegmental area (VTA). Rats were reared in three different environments: Isolate (impoverished, isolate-reared), Iso-play (enriched, isolate-reared), and Enriched (enriched, group-reared). The rats were then sacrificed and the number of DA containing cell bodies in VTA tissue sections was determined by tyrosine hydroxylase-immunocytochemistry. No significant difference in DA cell body number was observed between the different treatment groups. These results suggest that the decreased sensitivity to reward and increased learning speeds in enriched rats may arise from differences in neural complexity rather than the number of neurons in the VTA.

Poster Presentation P14

NOVEL POLY(ANILINE) FILMS AS ELECTROACTIVE SUPPORTS FOR ARTIFICIAL PHOTOSYNTHESIS IN A PLANAR MEMBRANE

Jennifer Faust and Stephen Hoffmann*
Chemistry Department, Illinois Wesleyan University

In order to develop a solar-powered energy conversion device that mimics photosynthesis, stable architectures are sought for planar-supported lipid bilayers across which a proton gradient can be generated. Specific studies focused on two areas: the polymer interface and the substrate electrode.

In Part I, the polymer interface consisted of alternating layers of poly(aniline) (PANI) and poly(acrylic acid) (PAA). When taking multiple cyclic voltammograms of (PANI/PAA)2 on an indium-tin oxide (ITO) electrode, the current decreased with each potential cycle, suggesting instabilities in the films. In response to this phenomenon, the effects of potential cycling on the structural and electrochemical properties of the film were investigated.

In Part II, the ITO electrode was replaced with an alkanethiol-modified gold electrode. In comparison to ITO, the modified gold electrode provided a smoother, more stable support for the polymer interface. Moreover, (PANI/PAA)2 films on modified gold electrodes and on ITO showed a comparable pH response.

Poster Presentation P15

AN ECONOMIC ANALYSIS OF THE EFFECT OF STEROIDS ON SEASON BEST PERFORMANCES IN TRACK AND FIELD

Allison Fisher and Michael Seeborg*
Economics Department, Illinois Wesleyan University

This paper investigates the relationship between steroids and season best performance statistics in track and field over the period from 1949 to 2007. Certain event groups have seen a faster drop in season bests than others. Medical research on the effect of steroids on slow and fast twitch muscle fiber indicates that certain event groups (e.g., sprinters, distance, throwers, jumpers) would benefit more than other event groups (e.g., distance runners) from steroids. The theoretical framework underlying my research is production theory from the economics literature where inputs such as coaching, facilities and steroids produce season best performances. Based on this theory and scientific research on muscle fiber, I hypothesize that steroids allow sprinters to improve their season bests more than other event groups. As expected, the regression analysis shows that the effect of steroids on performance varies across track and field events.

Poster Presentation P16

EXCYSTMENT OF OVER-WINTERING STATOBLASTS OF THE FRESHWATER BRYOZOAN *PECTINATELLA MAGNIFICA*

Anthony Gunnell and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Colonies of *Pectinatella magnifica* were collected in October of 2007 from Crab Orchard Lake in Southern Illinois. Colonies consisting of hundreds of individuals (zooids) were maintained in the laboratory at IWU in large culture dishes in freshwater from Crab Orchard Lake. Like other phylactolaemate bryozoans, zooids of *P. magnifica* produce environmentally resistant statoblast. These over-wintering structures house totipotent tissue that under favorable conditions regenerates a single zooid that by budding recreates the large gelatinous colony typical of this species. The primary objective of this project was to induce excystment of statoblasts produced by laboratory maintained colonies. Because these statoblasts generally require a period of dormancy that includes reduced ambient temperature, statoblasts were collected on filter paper in Petri dishes and stored in the refrigerator at 320C. After a period of at least two weeks, statoblast were transferred to freshwater in culture dishes and subjected to variations in light, temperature, and available food. After several weeks, at 260C, constant light, and high food content in the water, several statoblasts excysted and produced zooids. However, only a low percentage of statoblasts excysted, and attempts to induce further excystment have not been successful.

Poster Presentation P17

THE SAFETY AND EFFICACY OF DRUG ELUTING STENTS IN POST-HEART ATTACK RECOVERY

Alex Hahn, and Dr. Nicolas Shammas*
Biology Department, Illinois Wesleyan University
Midwest Cardiovascular Research Foundation

Recent concerns regarding the safety and efficacy of drug-eluting stents has led to further studies in post-heart attack recovery. Some researchers report an increased incidence of acute stent thrombosis (AST) leading to subsequent myocardial infarctions within the stented regions of the heart after anti-platelet drugs have been discontinued. The purpose of this study was to determine the safety and efficacy of Taxus® drug eluting stent and the correlation between the length of anti-platelet administration and further problems. The study population included patients who had an ST-elevated myocardial infarction within the past three years and were given drug eluting stents. Excluded patients included those who had bare metal stents, those who could not tolerate anti-platelet therapy, and those patients who had stents implanted prior to the study's beginning. Patients were interviewed and records were obtained from consenting individuals. Endpoints of death, incidence of acute stent thrombosis, and of recurrent myocardial infarction due to either target lesion revascularization or target vessel revascularization were determined. The results of this study will be used to evaluate any relationship recurrent heart attack, acute stent thrombosis and length of anti-platelet therapy.

Poster Presentation P18

OBJECTIVES OF USING RAPE AS A WEAPON OF WAR: THE PERPETRATORS' PERSPECTIVE

Rachel Halfpap and Michael Weis*
International Studies Department, Illinois Wesleyan University

Wartime rape is a political act. While time periods and historical situations vary, the fact remains that rape serves as an effective weapon of war whose perpetrators are fully aware of their agency in actuating their end goal. Perhaps more startling, these aims are eerily similar as exemplified in the genocides of Bosnia-Herzegovina and Rwanda. Nothing is new about the use of rape as a weapon in war; prior to the International Criminal Tribunals for Yugoslavia and Rwanda, rape was considered to be just another component of all that was fair in war. This presentation will examine what has changed in the international system concerning rape with regards to recent conflicts marked by utter brutality and complete contempt for humanity. Furthermore, the presentation will seek to explain why perpetrators view rape as a legitimate weapon of war and how they are able to accomplish their ultimate aims.

Poster Presentation P19

STRESSED -OUT RATS: CAN CHANGING CONTEXTUAL CUES IMPROVE THEIR DEFICITS IN LEARNING A NEW TASK?

Janell Harro and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Chronic stress has been shown to have many damaging effects on the body, including impairment of hippocampal-dependent memory. Long-term exposure to corticosteroid (stress) hormones following chronic stress can lead to brain impairment, including a retraction of dendritic processes in the hippocampus, decreased hippocampal volume, and suppression of neurogenesis in the dentate gyrus. The hippocampus has been shown to process spatial and contextual information. Previously, we have shown that adding a context-shift during transfer from a reward-based (appetitive) to punitive-based (aversive) task alleviated learning deficits found in rats. This supports the idea of hippocampal involvement in learning avoidance after transfer from an appetitive task. Our study examined the effects of chronic stress on performance on an appetitive-to-aversive transfer-learning paradigm, and subsequently the effect of adding a context-shift at the point of transfer. Chronic stress was induced through restraint for six hours a day over the course of six weeks. The animals were tested in an operant conditioning chamber. Once the animals scored 90% or higher correct responses for two consecutive days in the appetitive task, they were transferred to 10 days of aversive training. We found that chronically stressed rats performed worse on both the transfer and aversive-only learning. Learning deficits were alleviated in stressed rats exposed to changes in the environment (contextual shift) during task-learning trials. Although the impairments seem to be aversive-specific, they were moderated in response to a context-shift, which suggests that chronic stress may impair hippocampal functioning in combination with affecting other brain structures, such as the amygdala.

Poster Presentation P20

THE UPTAKE OF DISSOLVED ORGANIC MATTER BY JUVENILE *NEMATOSTELLA VECTENSIS*

Jessie Yesensky, Allison Hebron and Will Jaeckle*
Biology Department, Illinois Wesleyan University

Among marine invertebrates, nutrients can be acquired by consumption of particulate forms of food and through the absorption of organic molecules in seawater. We evaluated the ability of juvenile sea anemones (*Nematostella vectensis*) to take up dissolved organic matter (DOM) from seawater. As a cnidarian, the starlet sea anemone is diploblastic, composed of an endoderm, ectoderm, and an intervening mesoglea. Previous research has examined the uptake of DOM by the ectoderm and endoderm by anemone planula larvae. To investigate the mechanisms of DOM uptake, individuals were exposed to fluorescently labeled protein and a polysaccharide (2 mg/mL) for seven hours. Using fluorescence microscopy, we monitored the distribution of fluorescent labels with increasing exposure times. Vesicles containing protein, polysaccharide or both were found only in the endoderm. The distribution of vesicles containing the fluorescent molecules suggests the uptake of larger molecular weight proteins and polysaccharides was non-specific pinocytosis rather than receptor-mediated endocytosis.

Poster Presentation P21

HYPERSPECTRAL IMAGING OF TUMORS USING GOLD NANOSHELLS

Matthew Huddle and Dr. James Tunnell*
Chemistry Department, Illinois Wesleyan University
University of Texas - Austin

Pancreatic cancer is one of the most deadly types of cancer, with a five-year survival rate of only 5.0% if all stages are taken into account. Surgical treatment improves the five-year survival rate to 15-25% in patients without metastatic disease, provided negative margins are obtained. As nanoshells preferentially accumulate in certain types of tumors, we aim to develop an imaging system that could be used during surgery to expose positive margins, the boundaries of which cannot reliably be seen with the naked eye. Here, we report progress towards developing a hyperspectral imaging system for the visualization of gold nanoshells.

Poster Presentation P22

DIVERSITY OF ARCHAEAL AMMONIA OXIDIZERS IN FRESHWATER WETLAND AND TERRESTRIAL ENVIRONMENTS

Kristiyana Kaneva and John J. Kelley*
Biology Department, Illinois Wesleyan University
Loyola University Chicago

Nitrification, the oxidation of ammonia to nitrite and nitrate, is a key step of the nitrogen cycle that is catalyzed only by microorganisms. The first step in nitrification, the oxidation of ammonia, is catalyzed by the enzyme ammonia monooxygenase, which is encoded by the gene amoA. Previously ammonia oxidation was thought to be restricted to certain groups of Proteobacteria. However, recent studies have shown that some nonextremophilic Archaea are capable of catalyzing nitrification and contain amoA, but very little is known about the diversity and distribution of Archaeal ammonia oxidizers. In this study molecular techniques were used to detect Archaeal ammonia oxidizers in freshwater wetland sediments and terrestrial soils. PCR primers designed to specifically target Archaeal amoA were used to amplify Archaeal amoA genes from these environmental samples, and the genes recovered were cloned and sequenced. The sequences we collected were then compared to Archaeal amoA sequences downloaded from Genbank. Phylogenetic analysis showed that our sequences were most closely related to sequences from terrestrial and freshwater habitats and were distinct from sequences obtained from marine habitats. In addition, our terrestrial and wetland sequences formed several distinct clusters in the phylogenetic tree.

Poster Presentation P23

SIGLEC-9 EXPRESSION DURING NEUTROPHIL APOPTOSIS AND ITS ROLE IN NEONATAL INFLAMMATION AND CHRONIC LUNG DISEASE

Sarah King and Brian Walter*
Biology Department, Illinois Wesleyan University

Neutrophils are a specialized type of white blood cell that mediate inflammatory immune responses following microbial invasion. Upon infection, neutrophils migrate to the infected tissue, help clear the infection, go into apoptosis, and are then cleared by macrophages. In neonatal neutrophils, the apoptotic pathway appears to be delayed (Allgaier et al., 1998). As a result, in some premature neonates, the neutrophils persist in the environment and continue to initiate an inflammatory immune response, leading to chronic lung disease (Oei et al, 2003). Siglec-9 is a specific protein thought to be involved in the apoptotic pathway of neutrophils, stimulating the programmed cell death (Von Gunten et al., 2005). This study examines the levels of Siglec-9 expression in both adult and neonatal neutrophils upon stimulation of a bacterial peptide. Dose response studies, as well as time response studies were conducted. For both experimental designs, the neutrophils were isolated from whole blood samples, stimulated by a bacterial peptide, and lastly Siglec-9 expression in cells was analyzed using Flow Cytometry. It was found that there were no statistical differences in the levels of Siglec-9 expression in neonatal and adult neutrophil populations. In the time response studies, it was found that adult neutrophils had no statistical change in Siglec-9 expression. However, in the neonatal neutrophils there was a significant decrease in Siglec-9 expression after 30 minutes of stimulation. This suggests that the decrease in the level of Siglec-9 expression upon bacterial stimulation may be involved in the apoptotic delay seen in neonatal neutrophils.

Poster Presentation P24

DIFFERENCES OF THE T CELL FUNCTIONAL PROFILE IN TWO VACCINE REGIMENS USING FLOW CYTOMETRY

Kristen Kopf and Nancy Sullivan*
Biology Department, Illinois Wesleyan University
The National Institutes of Health

Ebola hemorrhagic fever is a severe, often fatal disease in humans and nonhuman primates that is found primarily in central Africa. With a mortality rate between 50% and 90%, and no known cure available, it is necessary to develop a vaccine for protection.

Previous studies have shown that DNA vaccine only regimen does not provide protection against Ebola in Macaques whereas the regimen of DNA vaccine priming with the addition of recombinant Adenoviruse (DNA/rAdv) boosting does. Since the antibody titers in the DNA only animals are comparable with those in the DNA/rAdv regimen, this suggests it is a T cell, and not a B cell, response deficiency that leads to failed protection. Thus, by examining the profiles of T cell responses from the same animal before and after rAdv boosting, we can determine the threshold between protective and nonprotective immunity, and provide better insight into vaccine design for Ebola virus.

To carry out these aims, we used multiparameter flow cytometry, looking for an antigen specific response. We then used the programs SPICE and FlowJo to analyze the data. Our data reveals a higher T-cell response with the DNA/rAdv regimen, although one can see from this study that the quality of immune response differs in ways other than the number of T cells generated.

Poster Presentation P25

WHAT IS INFLUENCING JUVENILE VOLUME AND WEIGHT?

Ellen Kozak, Rhiannon Steffen, Morgan Tarbutton, Jeff Wessel and William Jaeckle*
Biology Department, Illinois Wesleyan University

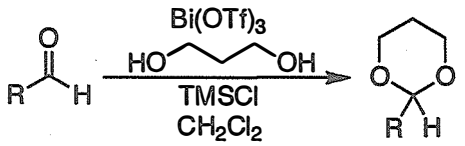
Intuition predicts the more nutrients available during development, the larger the offspring. Larger amounts of ingested nutrients should increase juvenile size above that if lesser amounts of nutrients were consumed. The freshwater snail, Physa sp., is hermaphroditic and lays its encapsulated eggs in a mass of jelly-like material. The capsular fluid contains all of the available nutrients for the developing snail. We tested the hypothesis that a larger capsule would produce a larger juvenile because more nutrients are available to the developing embryo. Egg masses were collected and individual egg capsules were placed into separate wells for developmental observation. Length and width of each capsule and hatched juvenile were measured. After hatching the juveniles were frozen and then dried to a constant weight. Surprisingly, we found no relation between capsule volume and juvenile size. Instead, there was an inverse relation between capsule volume and juvenile volume per capsule volume. In essence, the relationship indicated that the proportion of capsular volume represented in juvenile size decreases with increasing capsule size. Two possible explanatory hypotheses are that snail embryos are metabolically inefficient, or that capsular size does not reflect available nutrients.

Poster Presentation P26

BISMUTH TRIFLATE CATALYZED SYNTHESIS OF DIOXANES FROM ALDEHYDES

Scott Krabbe and Ram S. Mohan*
Chemistry Department, Illinois Wesleyan University

Aldehydes are reactive functional groups that often need to be protected during the course of a total synthesis. Cyclic acetals (dioxanes) are useful protecting groups for aldehydes because they are stable to basic conditions. We have developed a mild and efficient bismuth triflate catalyzed synthesis of dioxanes. Bismuth compounds are attractive as catalysts because of their remarkably low toxicity, ease of handling, and relatively low cost. The results of this study will be presented.



Poster Presentation P27

THE EFFECTS OF CLASS YEAR AND ACADEMIC SPECIALIZATION ON BOTH DOMAIN-GENERAL AND DOMAIN-SPECIFIC CREATIVITY

Craig Landers and Jean Pretz*
Psychology Department, Illinois Wesleyan University

A cross-sectional study of 194 undergraduate students, varied in class year and field of academic specialization, examined differences in both domain-general and domain-specific creativity. In the domain-general task, participants thought of original uses for common objects. In the domain-specific task, participants described their dream project within their field of academic specialization. We hypothesize a main effect of academic specialization on the domain-general and domain-specific tasks. Arts majors will score highest, science majors lowest, and social science majors in the middle. We expect an interaction between class year and type of creativity. Domain-general creativity will decrease as academic year increases, and domain-specific creativity will increase as academic year increases. We also predict an interaction effect between academic specialization and class year. Across class year, arts majors will show the smallest and science majors the largest decrease in domain-general creativity, and arts majors will show the largest increase and science majors the smallest increase on domain-specific creativity.

Poster Presentation P28

THE EFFECTS OF VIOLENT CONTENT AND COMPETITION WITHIN VIDEOGAMES ON THE DEVELOPMENT OF HOSTILITY AND AGGRESSIVE BEHAVIORS

Courtney Lee and Brad Sheese*
Psychology Department, Illinois Wesleyan University

Research has shown that exposure to violent video games can lead to increases in hostility and aggressive thoughts, feelings, and behaviors. Previous studies have commonly manipulated exposure to violence by assigning participants to play different video games that were considered to be either more or less violent. The current study utilized specially designed video game levels that allowed for a more precise manipulation of game violence. All participants played a video game that required exploration and shooting targets. However, participants were randomly assigned to shoot at inanimate objects (less violent condition) or to shoot at human characters (more violent condition). It was hypothesized that participants in the more violent condition would express more aggressive thoughts and feelings after playing the video game. The second issue examined in this study was the influence of competition. Video games often combine aspects of competition as well as violence. This study sought to examine each factor independently. Competition was manipulated by assigning participants to a more competitive condition where they rewarded for outperforming other players, or a less competitive condition where they were randomly selected to receive a reward regardless of performance. Results show a significant three-way interaction between competition, violent content, and gender. Males in the more violent and more competitive condition reported significantly greater hostility following exposure to the game. Females showed significantly greater hostility in response to competition but no evidence of greater hostility in response to violence.

Poster Presentation P29

"HOW SKINNY I GOT AND HOW FUCKING WEIRD I WAS": MICHAEL SHANNON, SARAH KANE, AND *WOYZECK*

Marti Lyons and Kate Roark*
School of Theatre, Illinois Wesleyan University

September 27th, 2007 I conducted an interview with Michael Shannon concerning his role as the title character in *Woyzeck* directed by Sarah Kane at the Gate Theatre in 1997. As the bulk of academic focus has been on Kane as a playwright, I am offering a new perspective on her artistry by presenting her work as a director through the examination of this interview. This examination is a worthy one, because the production was highly reviewed. Michael Billington, British theatre's most renowned critic, calls Kane's *Woyzeck* "a flawless production." Mark Ravenhill, notorious playwright who authored Shopping and Fucking, comments on *Woyzeck* stating, "I told her it was just about the bleakest thing I'd ever seen." The reviews of the production marvel both at the excellence and the dismalness of the performance. The title quote, taken from my interview with Shannon, captures the essence of the artistic process that Shannon and Kane shared, and the product, which the reviewers witnessed. Shannon explains that, considering Kane's writing, the process was surprisingly traditional. Kane primarily used method-acting techniques, but, less surprisingly, the techniques were extreme. In the interview Shannon explains that he lived with Kane at the time of performance, starved himself, and fell in love with Kate Ashfield, the actress who played Marie. In addition to my interview with Shannon, my primary sources are the reviews of *Woyzeck*, Kane's obituary in *The Independent* (the source of the Ravenhill's quote), and Graham Saunders' 2000 interview with Kate Ashfield. It is through these sources I intend to begin to illuminate Kane's directorial process.

Poster Presentation P30

COMPARISON OF CERATOHYAL DEVELOPMENT IN *DANIO RERIO* AND *HEMIGRAMMUS ERYTHROZONUS*

Sudil Mahendra and Brian Walter*
Biology Department, Illinois Wesleyan University

Although the tetra *Hemigrammus erthryozonus* and the zebrafish *Danio rerio* are both considered Ostariophysian fishes, they exhibit different bone and cartilage growth patterns during development. Utilizing whole mount alcian blue and alizarin red staining, we examined the pattern of growth of the ceratohyal cartilage in *Hemigrammus erythrozonus* and *Danio rerio.* Comparisons were made between these two fishes in regard to overall size and length of the ceratohyal as well as the patterns of ossification. Our data revealed that *Hemigrammus* possesses a larger ceratohyal, morphologically distinct from that of *Danio.* Moreover, the growth and subsequent ossification occurs more rapidly in *Hemigrammus*. The differences observed may correlate with discrete predatory and/or behavioral niches occupied by these fishes in their respective environments. These initial data provide a basis for further studies, including a more detailed analysis of the development of the ceratohyal cartilage and a determination of how skeletogenic genes are differentially expressed between these two species.

Poster Presentation P31

HABITAT SELECTION AND THE EFFECTS OF PREDOMINATING LIGHT ON THE DEVELOPMENT OF *TENODARA ARIDIFOLIA SINENSIS*

Christopher J. Marks, Lukasz J. Sewera and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Tenodara aridifolia sinensis, also known as the Chinese praying mantid, is an introduced species in North America. With no major predators, this insect has thrived and successfully incorporated itself into ecosystems throughout the Midwest and Eastern seaboard. Juveniles of *T. aridifolia sinensis* are easy to rear in laboratory settings, making it an ideal insect for experimentation.

Specimens of *T. aridifolia sinensis* have three predominant morphological patterns with respect to exoskeleton coloration; they are green, brown, or a mixture of the two. As such, these insects are usually found in habitats similar to their color (i.e., green mantids are found on leaves, brown ones on bark). This study sought to determine whether mantis exoskeleton color was under the control of environmental influence, namely the predominating color of light in which they live. Approximately one hundred nymphs of *T. aridifolia sinensis* were reared from birth, isolated in chambers with colored light (red, blue, green, and clear). All other environmental factors were standardized. Color was quantitatively assessed using a spectrophotometer to measure reflected wavelength from the exoskeleton of each mantid.

Additionally, this study built upon previous research (Wilder 2004) with regard to factors used by specimens of *T. aridifolia sinensis* in selecting a suitable habitat. Twenty nymphs of *T. aridifolia sinensis* were subjected to a habitat selection experiment, whereby each nymph was placed in a chamber with four choice paths, each with a different habitat treatment (e.g., cricket feces, pollen, bright colors). Time-lapse photography was used to record mantis activity.

Poster Presentation P32

THE EXPRESSION OF RECOMBINANT HEMOGLOBIN IN *ESCHERICHIA COLI*

Chris Miedema, Evan Mason and Brian Brennan*
Chemistry and Biology Departments, Illinois Wesleyan University

Sickle-cell disease is a genetic blood disorder characterized by sickle shaped red blood cells. This is the result of a mutation present in hemoglobin that causes it to polymerize into long fibers. The "sickled" cells have restricted movement through the blood stream and often clog capillaries leading to periodic painful attacks, difficulty transporting oxygen, and organ damage. We would like to develop therapeutics for this disorder by discovering molecules that can bind to hemoglobin and prevent its polymerization.

In order to study this disease and develop therapeutics, it is necessary to express and purify normal adult hemoglobin (Hb) as well as the mutant sickle-cell hemoglobin (HbS). Thus far, we have successfully overexpressed recombinant hemoglobin in *Escherichia coli*. Additionally, we have used site directed mutagenesis to construct a plasmid capable of expressing hemoglobin with the sickle-cell mutation. With this work in place, we will be in a position to start screening for novel therapeutics.

Poster Presentation P33

ATTRACTIVENESS, ODOR INFLUENCES, AND CONTEXT-DEPENDENT MEMORY

Ian Mobley and Renee Countryman*
Psychology Department, Illinois Wesleyan University

The current study was designed to examine the effects of odor on ratings of attractiveness and context-dependent memory. Previous research indicates that memory is better when contextual cues remain constant. There is also evidence that odors serve as contextual cues. With this in mind, students were asked to rate the attractiveness of 50 faces of anonymous college students in a classroom that smells of cigarettes (negative odor) or fresh linens (positive odor). Two weeks later students returned to the same classroom and performed a memory test for the faces previously viewed with either a context congruent smell or context incongruent smell. We hypothesized 1) ratings of attractiveness will be lower among students in a cigarette scented room as compared to previous baseline ratings of attractiveness; 2) ratings of attractiveness will be higher among students in the fresh linens scented room as compared to the students in the cigarette scented room; 3) memory for faces viewed previously will be better when tested in a context congruent environment as compared to a context incongruent environment. The results will have implications for expanding our knowledge of context-dependent memory, and more importantly whether or not the presence of cigarette odor results in decreased ratings of attractiveness.

Poster Presentation P34

THE EFFECTS OF SOCIAL OSTRACISM ON FRONTAL ELECTROENCEPHALOGRAM ACTIVITY

Jennifer Morozink and Joseph Williams*
Psychology Department, Illinois Wesleyan University

The need for social connections is so critical for psychological well being that the brain has evolved neural mechanisms that elicit a pain response whenever one is excluded from social situations. To determine the neural correlates of social rejection, female college students (N = 80) entered a chat room environment where they experienced phases of inclusion and exclusion while their theta electroencephalographic (EEG) activity was recorded in the frontal lobe. Recordings were taken from three frontal regions (F3, Fz, and F4). Results indicated that participants contributed less to the conversation during the exclusion phase, and they also were less interested and enjoyed this phase less. This suggests that the paradigm was successful in creating a feeling of exclusion in the participants. Preliminary analyses of EEG activity revealed decreases in theta power in the midline and left frontal regions during the exclusion phase. The differential EEG activity during inclusion and exclusion suggests that certain brain regions have different functions in the processing of an experience of social ostracism.

Poster Presentation P35

THE EFFECTS OF CARDIORESPIRATORY FITNESS ON BEHAVIORAL AND NEUROELECTRIC INDICES OF COGNITION

Elizabeth Mraz and Jason Themanson*
Psychology Department, Illinois Wesleyan University

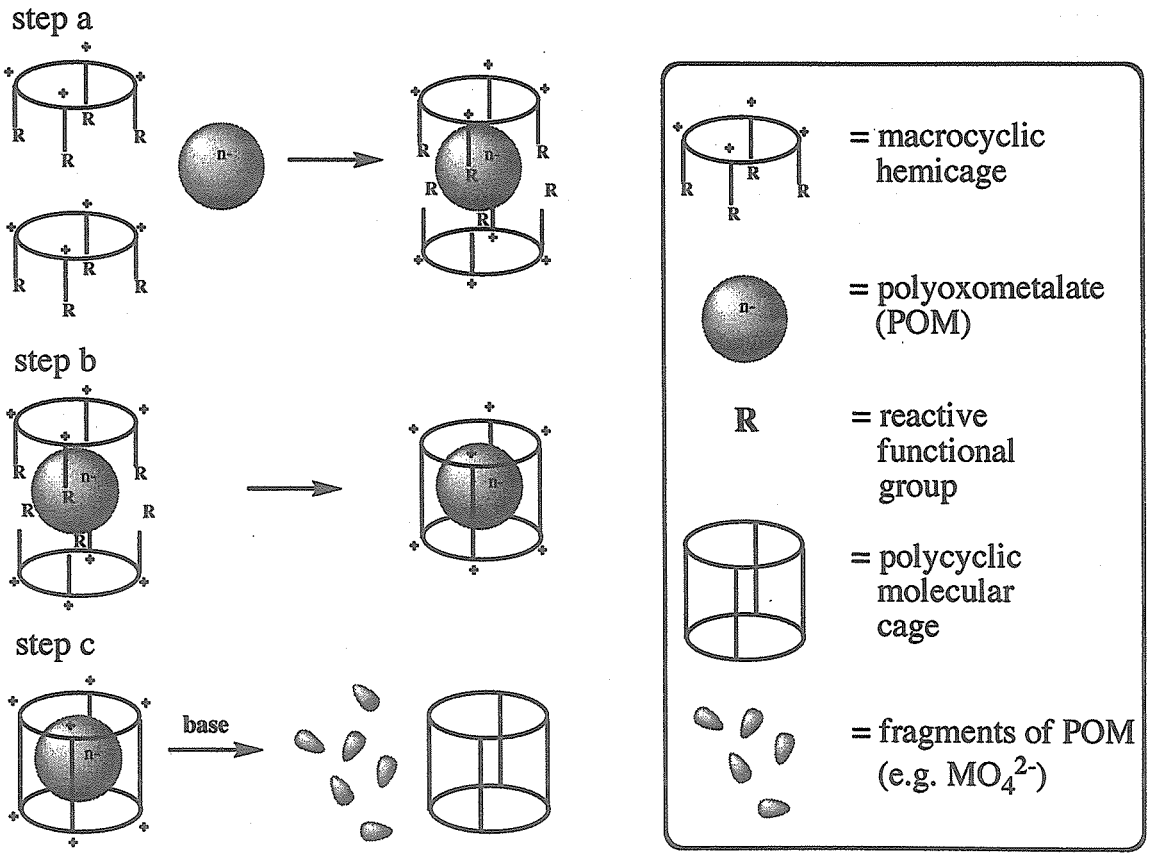
Effects of cardiorespiratory fitness on cognition were assessed for 72 young adults. Participants completed an executive control task while behavioral and neuroelectric indices of cognition were obtained. Measures of reaction time, response accuracy, P3 amplitude and P3 latency were examined in relation to fitness to determine the unique influence of fitness on cognition. A graded maximal exercise test was used to measure fitness by assessing maximal oxygen consumption. Higher fitness was correlated with longer P3 latency at central and frontal midline sites and an expectancy effect in relation to P3 amplitude for specific trial types and conditions, suggesting a relationship between fitness and neural indices of certain cognitive processes. However, fitness did not exhibit a unique relationship with behavioral indices of cognition. These findings suggest that while fitness may have beneficial effects on some executive control functions, these effects are not manifest in improved expectancy effects in the behavior of healthy young adults.

Poster Presentation P36

SYNTHESIS OF 30-MEMBERED AZAMACROCYCLES AS HOSTS FOR POLYOXOANION GUESTS

Melissa Myers and Rebecca Roesner*
Chemistry Department, Illinois Wesleyan University

The long term goal of this project is to create a capsule-shaped host molecule through the linkage of two macrocyclic compounds. This capsule is to be built around a polyoxometallate, a large, anionic cluster. Since most polyoxometallates decompose under basic condition, it may be possible to break down the polyoxoanion scaffold after the capsule is assembled. Size compatibility of the polyoxometallate and the macrocycles is essential, as these components must preferentially complex each other. Previous work on this project utilized fourteen membered macrocycles, which proved somewhat small to effectively complex with the polyoxometallate. Current work involves synthesis of much larger 30-membered macrocycles with the hope that they are more likely to provide a proper fit. In addition to steric factors, charge also plays an important role in determining whether the macrocycle and polyoxoanion will form an inclusion complex. Two different 30-membered rings are being investigated currently, one with four amine groups and the other with six. In acidic solution, the amine groups should form positive ammonium ions ideal for binding to the negatively charged polyoxometallate.

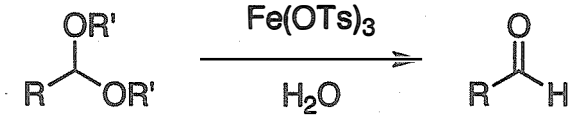


Poster Presentation P37

IRON(III) TOSYLATE CATALYZED DEPROTECTION OF ACETALS

Margaret E. Olson, James P. Carolan, Michael P. Devore,
Kendall K. Tashe and Ram S. Mohan*
Chemistry Department, Illinois Wesleyan University

Acetals are useful protecting groups in organic synthesis but they can also be converted to other desirable functional groups. Considerable efforts have been directed towards developing mild methods for deprotecton of acetals. Iron(III) tosylate is an efficient catalyst for the deprotection of acetals in water. Iron(III) compounds are attractive as catalysts because of their relatively low toxicity, ease of handling and relatively low cost. Water is an ideal solvent because it is nonflammable, cheap and readily available. Hence use in these reactions makes this method for acetal deprotection especially attractive.



Poster Presentation P38

THE ROLE OF MEDIAL SEPTAL GABAERGIC NEURONS IN PREFRONTAL CORTEX THETA MODULATION

Ryan Peterson and Joseph Williams*
Psychology Department, Illinois Wesleyan University

Theta activity recorded in various structures of the brain including the hippocampus, amygdala and prefrontal cortex (PFC) has been associated with attention, memory, decision-making and emotions. While several researchers have determined that hippocampal theta is gated by media septal area (MSA) neuronal firing, the same has not been equally demonstrated in the PFC. Previous research in this lab has shown MSA cholinergic neurons modulate PFC theta. However it is possible that other neurotransmitter systems, such as the MSA GABAergic system also help regulate PFC theta. Given that hippocampal theta is gated by both actelcholine and GABA, the GABAergic connections from the MSA to the PFC must be determined. Eight male Long Evans rats were used in the present experiments. A guide cannula was surgically placed in the MSA and a recording electrode was placed in the PFC. Several days later the rats were anesthetized with an injection of ketamine/xylazine and then infused with various doses of ethanol and the GABAergic agonist musicmol. The researchers predicted that both ethanol and musicmol in the MSA will reduce or eliminate theta activity in the PFC, similar to their effects on hippocampal theta.

Poster Presentation P39

ANALYSIS OF INVERTASE AS A CANDIDATE GENE FOR CHIP COLOR IN POTATO

Nathan Pratt and Elizabeth Balser*
Biology Department, Illinois Wesleyan University

Candidate gene analysis is a means of determining whether a gene is involved in observed variation in a given trait or characteristic. In this study, invGE is an invertase gene hypothesized to be a candidate gene influencing the sugars stored in potato cells. Increased reducing sugar content is associated with darker chip color. Using primers for the 2nd and 3rd exons of the invGE gene, sequences were obtained and analyzed for substitutions correlating with phenotypic variation of chip color. Variation at these exons was associated with differing levels of reducing sugars, suggesting substitutions may be responsible for variation in chip color.

Poster Presentation P40

INCREASING CONDOM-RELATED BEHAVIORAL INTENTIONS, MOTIVATION, AND WILLINGNESS VIA SOCIAL TIES IN ADVERTISEMENTS

Marylee Richardson and Natalie Smoak*
Psychology Department, Illinois Wesleyan University

Although researchers have identified factors associated with increased condom use, condom use rates are still less than ideal. In an attempt to increase condom use, various advertising techniques have been implemented, but, to date, these techniques have been largely self-focused. Based on research in exercise adherence and cognitive interdependence, the current study used advertisements targeting social ties in an attempt to increase condom use. Approximately 120 Illinois Wesleyan University students viewed one of six critical advertisements; these advertisements were either self, relationship, or friendship focused and featured either condoms or sunscreen. After rating the advertisement's effectiveness, participants completed measures assessing their product-related implicit and explicit attitudes, intentions, motivation, willingness, and behaviors. I hypothesized that the social ties condom advertisements would be rated as more effective than the self-focused condom advertisements and would result in more favorable, or approach-related, attitudes, intentions, and behaviors and increased willingness and motivation to use condoms. Additionally, I tested whether demographic variables influenced the hypothesized relations.

Poster Presentation P41

FUNCTIONAL ANALYSIS OF THE HUMAN FCGRT PROMOTER POLYMORPHISMS

Brian Rea and Dr. Robert Kimberly* and Dr. Kaihong Su*
Biology Department, Illinois Wesleyan University
University of Alabama at Birmingham

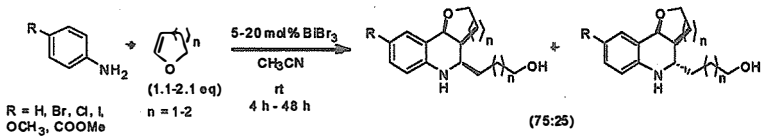
Recent studies have indicated that the neonatal Fc Receptor may play a role in autoimmune diseases such as Systemic Lupus Erythematosus (SLE). The neonatal Fc receptor (FCGRT, also called FcRn) mediates transmission of immunoglobulin G (IgG) from mother to fetus perinatally and also plays a central role in the protection of serum IgG from catabolism. The expression levels of FCGRT directly correlate with serum IgG concentrations. FCGRT deficient mice were protected against SLE because serum IgG level is not at the concentration necessary to produce autoantibodies leading to the disease. Therefore, understanding the transcriptional regulation of the human FCGRT gene and how genetic polymorphisms in the promoter affect the receptor expression will help identify alleles that contribute to autoimmune diseases. In this study, we sequenced 20 individuals and identified a 37 base pair deletion in the promoter region. Promoter reporter analyses in both monocytic U937 cells and epithelial MDA468 cells demonstrated that the proximal 1 kb promoter of human FCGRT confers the greatest promoter activity and the 1 kb promoter with the 37 nucleotide deletion leads to decreased promoter activity. Our data suggests that the transcriptional control of the human FCGRT gene may reside within 1 kb proximal promoter and the deletion polymorphism decreases the promoter activity. These results provide insights for the regulation of the endogenous FCGRT receptor expression and predict that individuals with the deletion polymorphism express lower levels of FCGRT. Lower levels of FCGRT may indicate that the deletion polymorphism acts as a protection against autoimmune disease.

Poster Presentation P42

ABISMUTH BROMIDE CATALYZED SYNTHESIS OF SUBSTITUTED QUINOLINES

Jamie L. Rogers, Justin J. Ernat, Herbie Yung and Ram S. Mohan*
Chemistry Department, Illinois Wesleyan University

An efficient, one step, bismuth bromide catalyzed synthesis of substituted hexahydrofuro[3,2,c]quinolines has been developed. The reaction proceeds via a coupling between various substituted anilines and two equivalents of an enol ether (either dihydrofuran or dihydropyran). The product is obtained as a 3:1 mixture of endo and exo isomers in moderate to good yields and have been characterized via ^{1}H and ^{13}C NMR. Characterization of products using NOE, HETCOR, and COSY experiments allowed for stereochemical assignments. Bismuth compounds are attractive catalysts due to their remarkably low toxicity, low cost and ease of handling. The results of this study will be presented.



Poster Presentation P43

BEHAVIORAL RESPONSES TO PREDICTABLE AND UNPREDICTABLE COMPETITORS AND C-FOS EXPRESSION IN THE AMYGDALA AND NUCLEUS ACCUMBENS

Jennifer Schnupp and James Dougan* and Renee Countryman*
Psychology Department, Illinois Wesleyan University

The present study examined the behavioral effects of the presence of a competitor on the behavior of individual rats in a foraging situation. Rats foraged in one of three conditions: alone for all of testing, alone for all of testing except the last day when a competitor was introduced, or with another rat for all of testing. Behavioral responses in each condition were examined; rats exposed to a competitor on only the last day displayed avoidance behavior while rats with a predictable competitor engaged in competitive wrestling. Differences in c-fos expression in the amygdala among conditions will be correlated to observed differences in behavior while differences in expression in the nucleus accumbens will be correlated to differences in sensitivity to reward. The present data extend the literature comparing the matching law to the idea free distribution by examining the differences in behavioral responses and the neural correlates.

Poster Presentation P44

NEGLIGENT ECONOMICS: AN ANALYSIS OF THE CALCULUS OF NEGLIGENCE

Matthew T. Sheehan and Michael Seeborg*
Economics Department, Illinois Wesleyan University

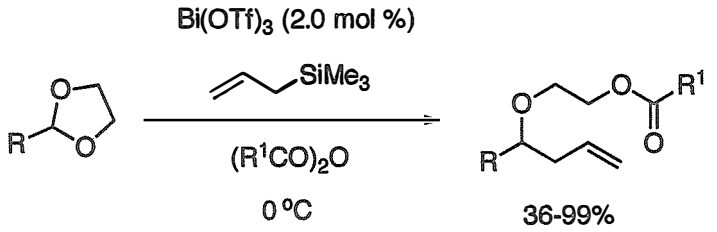
Improving the United States' legal liability system will maintain the safety and justice of our country. To advance legal methods, court decisions should be analyzed economically in an attempt to minimize costs and yield the optimal social outcome. This study determines whether the utilization of the calculus of negligence, a common law based on economic analysis, produces just and cost minimizing rulings. These cost minimizing rulings will lead to the aforementioned optimal equilibrium. Six United States court cases, judged on a matter of negligent liability, were selected for this study and analyzed with the criteria presented in the Hand Rule. These criteria establish whether the chosen cases employed the calculus of negligence and to what extent they minimized costs. The analysis found that rulings made under the Hand Rule generated the most fair verdicts and deterred costly future decisions. These results suggest that future common law should be rooted in economic analysis.

Poster Presentation P45

BISMUTH TRIFLATE CATALYZED ALLYLATION OF DIOXOLANES FOLLOWED BY *IN SITU* DERIVATIZATION TO GENERATE HIGHLY FUNCTIONALIZED ESTERS

Matthew Spafford, Matthew G. Huddle, James E. Christensen,
Joshua R. Lacey and Ram S. Mohan*
Chemistry Department, Illinois Wesleyan University

Cyclic acetals (dioxolanes) are useful protecting groups in organic synthesis but they can also be converted to other useful functional groups. Bismuth triflate is an efficient catalyst for the allylation of dioxolanes followed by *in situ* derivatization of the product with acid anhydrides to yield highly functionalized esters. Such multicomponent reactions reduce the number of steps and time necessary for a multi-step synthesis. Bismuth compounds are attractive as catalysts because of their remarkably low toxicity and ease of handling. The results of this study will be presented.



Poster Presentation P46

HEALTHCARE WITHOUT HARM? A PVC-FREE HOSPITAL

Alissa Sherman and Laurine Brown*
School of Nursing, Illinois Wesleyan University

Hospitals are institutions dedicated to providing healthcare. However, some hospital practices may pose health risks. Many hospitals use medical materials made from polyvinyl chlorine (PVC), such as nasogastric and intravenous tubing and bags. These materials contain a chemical called Di(2-ethyl-hexyl)phthalate, or DEHP, which makes the plastic flexible. In addition, PVC production and incineration release dioxin into the atmosphere, affecting public air quality and health. A literature review was conducted to analyze the safety of DEHP and dioxin in humans and the cost of adopting a PVC-free purchasing policy. Clinical research revealed that DEHP is correlated with reproductive disorders and dioxin is correlated with cancer and reproductive disorders. In addition, an analysis of PVC purchasing patterns determined that some PVC devices might be more expensive than alternative devices. By reducing the usage of PVC medical devices, the risk of cancer and reproductive disorders can be avoided. Therefore, a PVC purchasing plan is a viable option to reduce material costs and improve patient and public health.

Poster Presentation P47

THE EFFECTS OF THE NOREPINEPHRINE AGONIST, GUANFACINE, ON SCOPOLAMINE-INDUCED MEMORY IMPAIRMENTS IN THE RAT

Andrew Tharp and Renee Countryman*
Psychology Department, Illinois Wesleyan University

Cognitive deficits associated with Alzheimer's disease are known to result from decreases in acetylcholine within the cholinergic system of the medial septal area, which projects to the hippocampus. Recent studies suggest that increasing levels of the neurotransmitter norepinephrine may help to decrease the cognitive impairments associated with Alzheimer's disease and aging. The present study measured the effects that Guanfacine, an alpha-2 noradrenergic agonist, has on memory deficits produced by the acetylcholine antagonist, Scopolamine. Memory ability was assessed using an object recognition task and a socially transmitted food preference task. Following administration of Scopolamine, memory ability was significantly impaired from baseline levels on both memory tasks. Pre-training injection of Scopolamine followed by post-training injection of Guanfacine resulted in memory performance that was equivalent to baseline memory performance on both tasks. Guanfacine administration alone did not improve memory performance, but rather had a trend toward impairing performance. Results from this study indicate that Guanfacine may be effective at improving memory impairments caused by decreased acetylcholine function as seen in Alzheimer's disease.

Poster Presentation P48

HOST-GUEST INTERACTIONS BETWEEN NIOBIUM POLYOXOMETALATES AND NEUTRAL AZA-MACROCYCLES

Thomas Traynor and Rebecca Roesner*
Chemistry Department, Illinois Wesleyan University

During recent semesters, Dr. Roesner's research group has been investigating interactions between aza-macrocycles and polyoxometalates with the long-term goal of using polyoxometalates to direct the assembly of those macrocycles into supramolecular species. During those initial investigations, the group focused on Keggin polyoxoanions (e.g. $PW_{12}O_4^{3-}$, $SiW_{12}O_4^{4-}$), which are stable only at low pH conditions that also lead to protonation of the aza-macrocycles. The resulting polyoxoanion/ macrocycle adducts had properties consistent with the strong ionic bonds that held them together. They were poorly soluble in both water and polar organic solvents. In an effort to develop more-soluble polyoxoanion/adducts, the synthesis of niobium polyoxometalates (e.g. $Nb_6O_{19}^{7-}$ and $Nb_6O_{19}^{6-}$) is now underway. These niobium polyoxometalates are stable in basic solution where it will be possible to observe their interactions with neutral (free base) aza-macrocycles. It is hoped that the weaker, ion-dipole forces present in these systems will allow for greater solubility. This solubility should, in turn, allow for more-thorough spectroscopic investigation and the possibility of carrying out solution-based organic transformations on the polyoxoanion/macrocycle adducts.

Poster Presentation P49

PROMOTING ENVIRONMENTALLY RESPONSIBLE BEHAVIORS USING MOTIVATIONAL INTERVIEWING TECHNIQUES

Sarah Tribble and Linda Kunce*
Psychology Department, Illinois Wesleyan University

An experimental design will be used to determine whether environmentally responsible behaviors (ERBs) can be promoted by exposing participants to two motivational interviewing techniques provision of basic information and engagement in a decisional balance exercise. In addition to basic information, some participants will be exposed to personal norms (normative) information. The hypotheses are that (a) provision of basic information only will significantly promote ERBs over a no information control condition, (b) provision of normative information will significantly promote ERBs above that achieved through providing basic information alone, and (c) participation in a decisional balance exercise will significantly promote ERBs over a no decisional balance control condition. Effects on environmental attitudes and behaviors will be interpreted in light of existing theory and real-world applications.

Poster Presentation P50

PROTECTIVE QUALITIES OF DUCK CARBOXYPEPTIDASE D AGAINST ADENOVIRUS-MEDIATED APOPTOSIS IN PRIMARY RAT HEPATOCYTES

Bridget Wall and Dr. Linda Griffith* and Dr. Alexandria Sams*
Biology Department, Illinois Wesleyan University
The Massachusetts Institute of Technology

Duck carboxypeptidase D (DCPD) is a membrane-bound metalloenzyme of the secretory pathway that cleaves arginine or lysine from the carboxy terminus of a protein or peptide. In a prior study of DCPD, a known receptor for Hepatitis B, cells transfected with an adenovirus containing DCPD possessed a distinctly different morphology and vitality in comparison to the adenoviral constructs containing GFP or those lacking a transgene. In essence, DCPD protected the cells from adenovirus-mediated apoptosis, a self-destructive process which occurs upon viral DNA entry, incorporation, and translation. To investigate the mechanism by which DCPD prevents apoptosis, a variety of inhibitors and promoters were tested using primary rat hepatocytes to determine compounds relevant to the prevention pathway. In this pathway, arginine is used as a substrate by members of the nitric oxide synthase (NOS) family to synthesize nitric oxide. The elucidation of this mechanism may lead to further insight on the adenoviral response and perhaps eventual incorporation in a default adenoviral vector for use in gene therapy.

Poster Presentation P51

NATIVE AMERICANS AND STORYTELLING IN CONTEMPORARY AMERICAN SOCIETY

Molly Walter and Rebecca Gearhart*
Anthropology Department, Illinois Wesleyan University

For thousands of years Native American people have been using storytelling as a part of their strong oral history traditions. The stories they tell are not only a form of entertainment, but are powerful teachers and healers that help Native people cope with adversity and change. Story forms, themes, and modes of telling hold important information and insight into the cultures from which they hail. This poster presentation will explore the world of contemporary Native storytellers in the Midwestern United States and their perceptions of story's place in the Modern world. The collaborative nature of this ethnographic research brings to light the importance of Native traditions in the modern world through the unique perspective of Storytellers, who are, by the nature of their craft, extremely knowledgeable members of their communities. Many Americans are unaware of the strong Native American subculture that exists and thrives in this land today. Through interactions with pop-culture such as movies, sports teams, and other media, many Americans still generate and perpetuate stereotypes of how Native Americans should look and behave. Often Native culture is treated as an artifact of the past, and is not recognized as the lively and dynamic lifestyle of the over 4 million Native Americans that live in the U.S. today. The aim of this research is not only to reveal the significance of Native American storytelling to the modern world, but also to educate the public on the broader issues facing Native Americans in contemporary American society. Hopefully, people will be inspired to learn more about their own heritage and recognize and take responsibility for the power of their own stories to shape the world around them.

Poster Presentation P52

LEGISLATIVE VOTING: INFLUENCES ON ENVIRONMENTAL VOTING IN THE HOUSE OF REPRESENTATIVES

Krystyna Zwolinski, and Tari Renner*
Political Science Department, Illinois Wesleyan University

The question of what prompts legislators to vote as they do has long been the subject of much empirical political research. This research project contributes to this body of literature by addressing the question of what factors influence how members of Congress vote on environmental issues. More specifically, I examine how a combination of personal and constituency characteristics influence the level of environmental support of members of the House of Representatives in the years 2003 through 2006. The personal characteristics of the representatives examined are gender, party, and seniority; the constituency characteristics are region, urbanicity, occupation, education, and district ideology.